DRUMAG
SPECKEN

Solutions to your fluid power problems

Adsorption dryer SDAT

Operating instructions

Issue 04/2004

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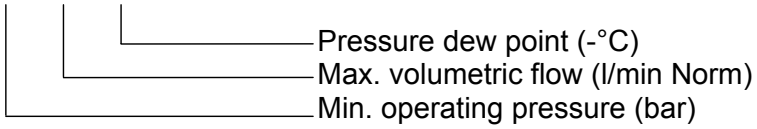
1. Technical data (general)

1.1	Compressed air section (key data)	Operating pressure	4 to 10 bar
		Compressed air input temperature	< 30 °C
		Pressure dew point	up to -70 °C
		Input volumetric flow	< 350 Nl/min
1.2	Electrical equipment	Valve insulation class	H
		Protection class	IP 65
		Ambient temperature	-10 to +50 °C
		Permissible frequency tolerance	± 5 %
		Permissible voltage tolerance	±10%

The operating pressure, maximum permissible volumetric flow and pressure dew point of your adsorption dryer can be read from the type plate.

Example: SDAT – G70/420 - P5 / 35 / 45 - PS - 230



2. Safety

Attention notice

Attention!

This **Attention!** notice appears at places in this operating manual to which particular attention must be paid.

Safety instructions

- The SDAT adsorption dryer has been built in accordance with the state of the art and is safe to operate if installed properly. The assessment of the operating safety within the entire plant must be carried out by the manufacturer of the entire plant.

- Every person who is involved with the installation and maintenance of the SDAT must have read and understood this operating manual and in particular these safety instructions.

- Electrical work must be carried out by persons who are qualified to do such work.

- Working on live parts is forbidden.

- Unauthorised conversions and alterations lead to the loss of the manufacturer's warranty.

- The SDAT adsorption dryer is dimensioned in accordance with the design data (operating pressure, temperatures, volumetric flow and desired pressure dew point). Each change of operating pressure, air temperature and/or volumetric flow will lead to a change in the pressure dew point.

Appropriate use as intended
SDAT adsorption dryer dry compressed air (elimination of water vapour from the compressed air) in accordance with the pressure swing adsorption method (heatless adsorption).
Any other use is deemed to be inappropriate. The manufacturer shall not be held responsible for any damage resulting from this.

3. General

Fundamentals

Work on electrical and pneumatic systems should only be carried out by employees who are qualified to do such work.

Only with knowledge of this operating manual can installation errors be avoided and trouble-free operation be guaranteed.

If you should experience difficulties despite this, please contact us, our field service employees or our agents.

We reserve the right to make technical changes.

Copyright

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4. Structure and function

4.1 Adsorption dryer

4.11 Structure

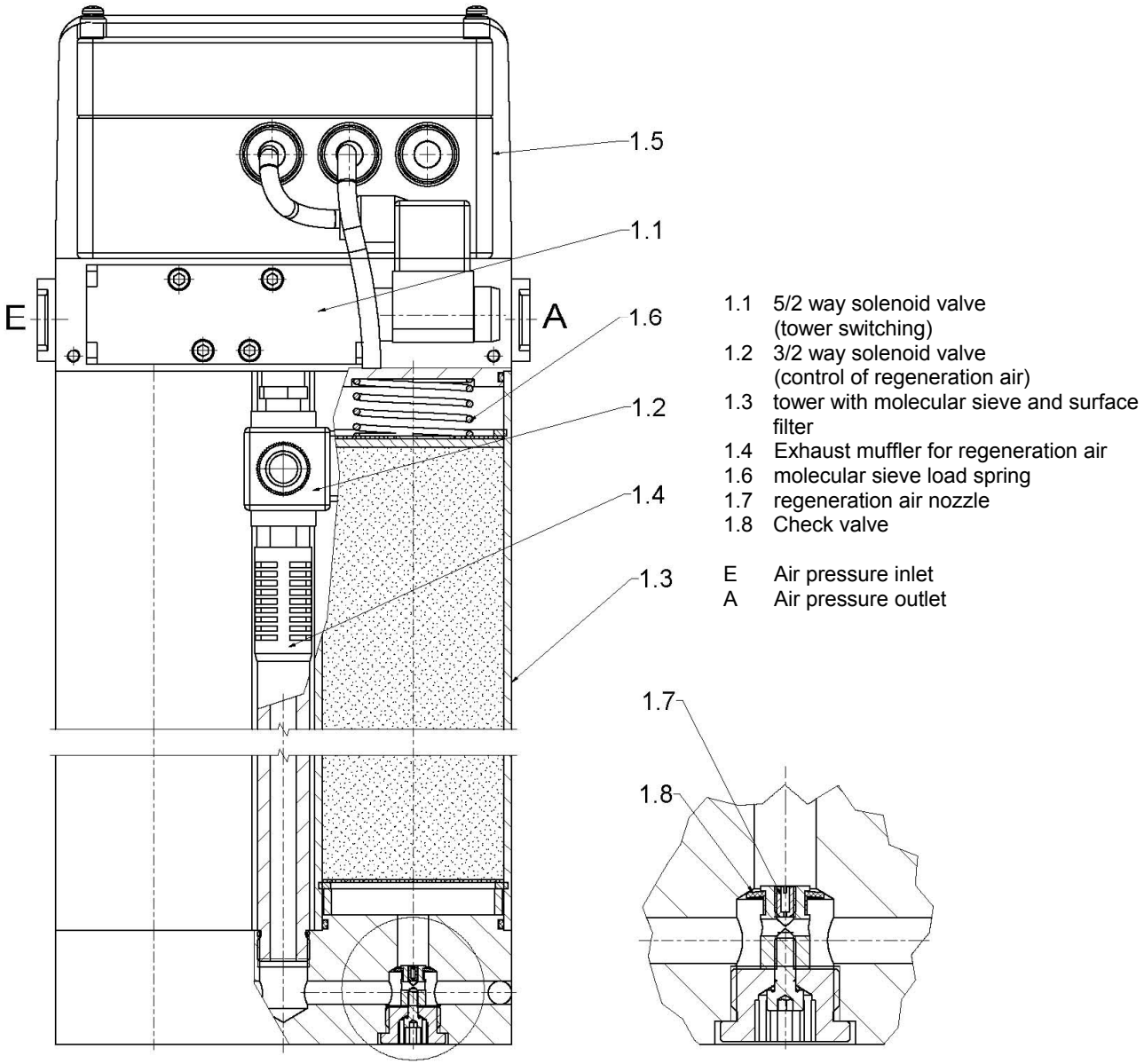


Fig. 1: SDAT

The SDAT adsorption dryer is equipped with two direct-switching solenoid valves, which control the main and regenerating air flows.
The two towers as well as the base and cover plates are manufactured from anodised aluminium. The direct-controlled solenoid valves are manufactured from high performance components in a very robust design.

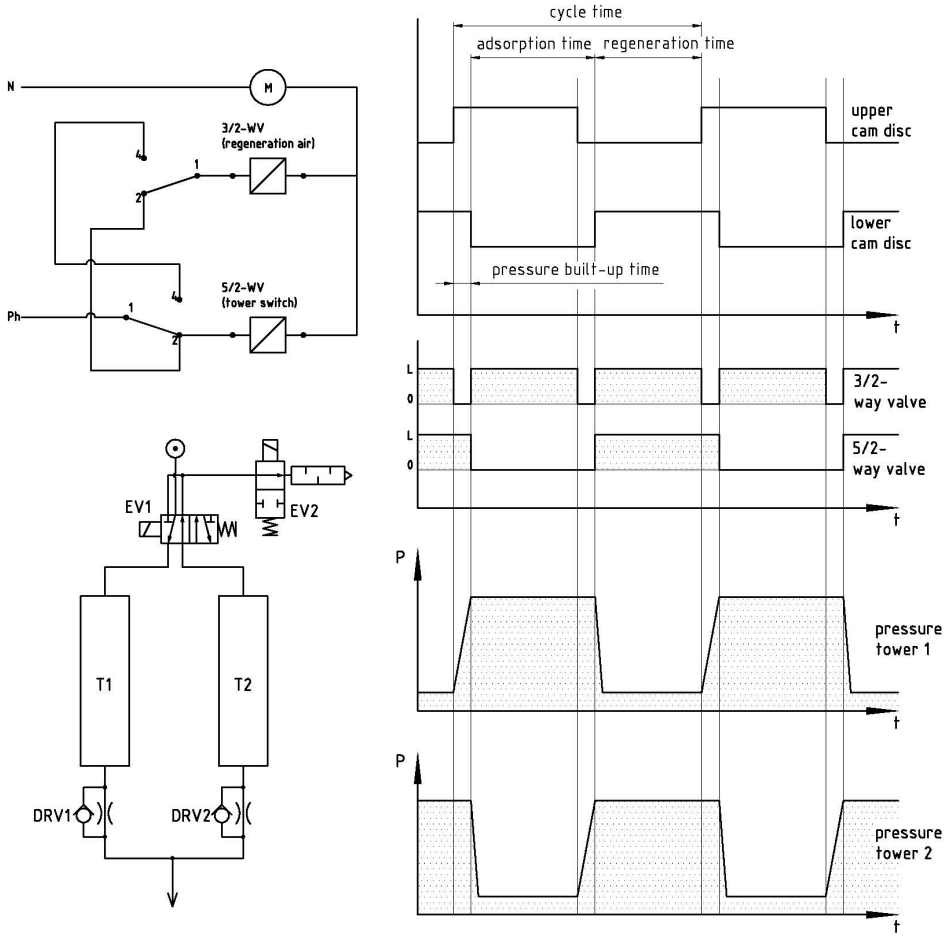
The 4A molecular sieve is clamped by a stainless steel spring between two 30 µm surface filters and two perforated plates. The molecular sieve is fixed inside the towers even when they are removed. The adjustment of the regenerating air takes place via orifice plates in the base plate.

4.12 Functional method

The SDAT adsorption dryer has two symmetrical towers. While the moist compressed air flows through one tower from top to bottom, whereby the water vapour is almost completely removed from the air, a part of the dried air flows through the second tower from bottom to top, takes up the water vapour again and transports it to the outside. After a specified time, the regeneration is interrupted and the pressure builds up in the tower concerned. Once the pressure level in the two towers is the same, switching takes place from one tower to the other. At the same time, the tower which is now to be regenerated is vented. The tower with the dried molecular sieve is now charged, whilst the molecular sieve in the other tower is regenerated. The amount of regenerating air, and hence the bore in the orifice plate, is determined by the partial pressure drop between adsorption and regeneration and the temperature of the compressed air.
The regeneration time is calculated from the selected amount of regenerating air, the dynamically used charging and the desired pressure dew point.

4.13 Valve switching sequence

The two solenoid valves control switching between the two towers as well as the regenerating air.
It must be noted that no air can flow without electrical control.
The switching sequence and the change of pressure with time are illustrated in the following diagram (fig. 2).



EV1	5/2 way solenoid valve
EV2	3/2 way solenoid valve
T1/T2	Adsorption towers
DRV1/DRV2	Throttle check valves
L	solenoid valve actuated
0	solenoid valve not actuated

Fig. 2: Switching sequence and change of pressure with time

4.2 Control

The valves are controlled by a built-in programme switching unit. This comprises a drive unit and two programme channels (fig. 3). The drive unit rotates the two program discs via a sliding coupling. Microswitches are actuated via the programme discs. In this manner the mechanical information is converted to electrical switching commands.
The programme switching unit allows interval operation of the adsorption dryer. The programme switching unit is installed in a housing which is fastened to the adsorption dryer.

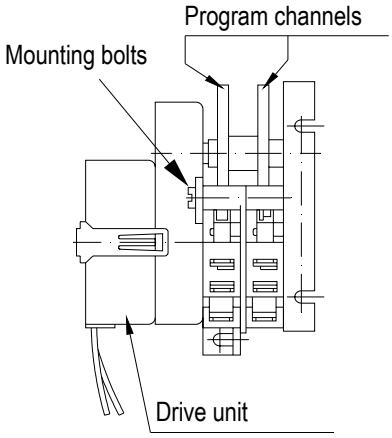


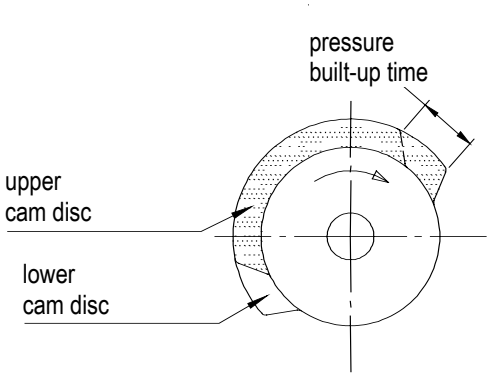
Fig. 3: Program switching unit

The overall cycle time is specified by the programme switching unit and is either 4 minutes or 10 minutes. If it should be necessary in exceptional cases to alter the pressure build-up time, this can be done by rotating the two cam discs against one another.

Attention! **Turn off the power to the device before opening the control housing!**

<u>To change the pressure build-up time:</u>

1. Turn off the power to the device
2. Remove the hood and the cover of the control housing
3. Unscrew the fixing screws on the programme switching unit and remove the drive unit together with the cam discs
4. Pull off the cam disc assembly from the drive motor
5. Rotate the cam disc pairs against one another in the fine notching Greater overlapping of the two cam disc pairs means a longer pressure build-up time. One notch is equivalent to about 1.2 seconds (4 min. device) or about 3 seconds (10 min. device)
6. Reassemble the drive unit, tighten the fixing screws
7. Close the control housing cover, fit the hood and screw it tight.



5. Installation

Attention! Electrical and mechanical work may only be carried out by qualified persons.

- The adsorption dryer must be mounted in a vertical position.
- Make sure that the pneumatic connecting pipes are free from all dirt.
- The SDAT adsorption dryer is delivered pre-wired and adjusted. The voltage data of the valve coils must be checked before connecting to the mains supply.

- It is recommended to install a compressed air filter with automatic condensate drain and a sub-micro filter before the adsorption dryer.
  Depending on the requirements for the compressed air, an active charcoal filter and a further sub-micro filter should be installed after the adsorption dryer. The sub-micro filter must in any case be provided if the small amount of debris from the molecular sieve could cause faults.

6. Operation

- The adsorption dryer can only dry the compressed air perfectly if the specified data as shown on the type plate is complied with (operating pressure and volumetric flow).
  A lower volumetric flow has a positive effect on the pressure dew point.
  If a lower pressure is required at the consumer, a pressure regulator must be installed after the adsorption dryer.

- The ambient temperature should lie between 4 °C und 30 °C.

7. Maintenance

- The activity of the molecular sieve is almost fully retained over a long period of time provided that due attention is paid to the treatment of the compressed air before the adsorption dryer. Oil borne with the compressed air is particularly damaging. It can block openings in the molecular sieve and reduce reactivation during regeneration.

- If the pressure dew point is no longer being reached, it is recommended not to draw off any supply air for about 3 to 4 hours. In this manner the adsorption dryer can regenerate itself.

- The partial pressure drop between adsorption and regeneration influences the attainable pressure dew point. It is therefore very important that the silencers for the regenerating air do not build up any back pressure due to contamination. The silencers are greatly over-dimensioned. If the pressure dew point is no longer being reached, contaminated silencers could also be a cause.

- If, despite the above-mentioned measures, the specified values are no longer being achieved, it is necessary to replace the molecular sieve. Please contact SPECKEN-DRUMAG regarding this.

- If the operating pressure needs to be reduced or the volumetric flow increased in relation to the specified values, this can be done if need be by exchanging the orifice plates and adjusting the switching times. Please contact SPECKEN-DUMAG in this case.

8. Spare parts

Please quote the type description and the serial number of the device concerned when ordering spare parts. Spare seals are only available in complete sets.